University of the State of New York.

37TH ACADEMIC EXAMINATION.

HIGHER ALGEBRA.

MONDAY, March 3, 1890—Time, 9:30 A. M. to 12:30 P. M., only.

44 credits, necessary to pass, 33.

1. Rationalize the denominator of the following fraction:

$$\frac{\sqrt{x} - 4\sqrt{x-2}}{2\sqrt{x} + 3\sqrt{x-2}} \quad 3$$

2. Divide $6a^{-1}b^{\frac{2}{3}}$ by $-3ab^{-\frac{1}{3}}$ 2

3. Form the equation whose roots are ± 3, $\pm\sqrt{-13}$, and solve the equation 4

4. Solve $\sqrt{x^2-3x+5} - \sqrt{x^2-5x-2} = 1$ 3

5. Solve $x^2 + y = 5(x-y)$.

$x + y^2 = 2(x-y)$ 4

6. Find two numbers such that their difference added to the difference of their squares shall make 150 and their sum added to the sum of their squares shall make 330 3

7. A traveler has a journey of 132 miles to perform. He goes 27 miles the first day, 24 the second, and so on, traveling 3 miles less each day than the day before. In how many days will he complete the journey? 3

8. Show that if, in a geometrical progression, each term be added to or subtracted from that next following, the sums or the remainders will form a geometrical progression 3

9. Show that log. b to the base a multiplied by log. a to the base $b = 1$ for any values of a and b 2

10. Find the 5th term of $(1-a^2)^{12}$ 3

11. If there are three routes between each successive two of the five cities, Boston, New York, Philadelphia, Baltimore, Washington, by how many routes could we travel from Boston to Washington? 3

12. Resolve the fraction $\frac{5x-12}{x^2-5x+6}$ into partial fractions .. 2

13. Expand $\frac{1-x}{1-2x-3x^2}$ into an infinite series 3

14. Find the value of x in $2^x = 16$ when log 2 = .30103 3

15. Required the three roots of the equation $x^3 = a^3$, or $x^3 - a^3 = 0$ 3